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AUTHOR Faraday, Sally; Harris, Richard
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ABSTRACT

Designing and adapting learning materials are the subjects of this document, one of 9 modules in an 11-unit resource pack designed to help trainers and postsecondary and continuing education staff meet the needs of special needs students in Great Britain. Having completed the module, staff should be able to: (1) state what learning materials are; (2) relate current literature to past and future learning; (3) differentiate between design and adaptation of learning materials; and (4) design and adapt materials to meet individual needs. The module describes good learning materials as those that: (1) reflect the content of the course; (2) match the learners' needs, interests, and abilities; and (3) are appropriate for the available time, money, equipment, and facilities. Staff are encouraged to broaden their search for appropriate materials to meet the needs and abilities of their special needs students. The module also addresses: (1) how learning materials fit into the learning process; (2) the process of designing and adapting materials; and (3) evaluating materials for relevance, requirements (prior knowledge, etc.), accessibility, appropriateness, flexibility, and the extent to which they facilitate learning, understanding, transferability, and extension. The module contains six exercises. (CML)

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6

LEARNING SUPPORT

DESIGN AND ADAPTATION OF LEARNING MATERIALS

CE 055 294

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INTRODUCTION

The need to provide flexible, relevant, challenging learning materials has never been greater as practitioners endeavour to meet the needs of an increasingly diverse group of learners. Providing materials to meet this wide range of needs is quite a challenge. However, the principles and skills involved are the same throughout. The difference is that you may need to design new materials or adapt existing ones to suit learners with special needs. This involves time and imagination but the pay-off can be enormous.

KEY QUESTIONS

- What are learning materials?
- What makes good learning material?
- How do you design or adapt material?

AIMS

- To analyse the nature of learning materials.
- To explore the processes of design and adaptation of learning materials.

OBJECTIVES

By the end of this element you should be able to:

- state what learning materials are;
- relate current learning to past and future learning;
- differentiate between design and adaptation of materials;
- design and adapt materials to meet individual needs.

USING LEARNING MATERIALS

A STARTING POINT

All good teachers/trainers attempt to provide their learners with learning materials which:

- reflect the content of their course/training programme;
- match the learners' needs, interests and abilities;
- are appropriate for the available time, money, equipment and facilities.

Providing materials for learners with special educational/training needs amounts to the same thing. The only difference is that you may need to expand your view of what constitutes a learner's needs, interests and abilities. You may also need to look further afield to find appropriate materials.

Most readily available learning materials have been designed to cater for 'average' learners. While the same content may be used for some learners with special educational/training needs, the presentation must be in a significantly different form, e.g. a written transcript of a videotape for a learner who is visually impaired. For other learners with special needs, specially designed materials are the only answer, e.g. an illustrated pictorial sequence rather than written instructions for a learner with few literacy skills.

●●●● EXERCISE 1. WHAT ARE LEARNING MATERIALS?

Whole group activity

It is important to get a picture of what learning materials are before exploring how you can develop them.
In this activity you are given the opportunity to explore both the range and uses of learning materials.

1. Brainstorm the materials that you could use to aid learning. (There are some obvious ones – worksheets, hand-outs, video, etc.)
2. Explore the range of materials that are listed. Emphasise that almost anything can be used to aid learning. Imagination provides the only limit.

●●●

3. Form small groups

Small group activity.

4. Brainstorm the possible uses of one of the following in aiding the learning of those with special needs. You may like to add your own.

   – a pile of leaves
   – a set of bricks

   The stimulus sheet gives some examples of how the two items have actually been used.

STIMULUS SHEET

Amongst others:

Leaves have been used:
- to form patterns;
- for numeracy work;
- for tactile stimulation;
- for making sounds.

Bricks have been used:
- for numeracy work;
- for construction principles;
- as musical instruments.

HOW DO LEARNING MATERIALS FIT INTO THE LEARNING PROCESS?

We have identified the following features of teaching/training and learning:

Attitudes – having a positive approach towards learners and their needs

Knowledge – of learners' needs and interests and appropriate strategies to meet them; content

Resources – using yourself, the learners and the whole environment; designing and adapting materials to meet individual needs and interests

Imagination – finding interesting ways of using knowledge and resources

These features are the 'tools' that are needed to support the learner, who should always remain at the centre of the learning process.

SIGNPOST

You will find more about **Teaching/Training and Learning Strategies** in the element (5) of that name. Refer first to the introduction.

The learning materials derived through this process provide the practical means by which the learner is enabled to learn.

EXERCISE 2. HOW DO YOU DESIGN AND ADAPT LEARNING MATERIALS?

Whole group activity

Before looking at the process in detail it is useful to gather together your own thoughts and ideas.

This activity uses a case-study to help you form your own opinion.

1. Read through the case-study below.
2. Brainstorm the factors you need to take into account to provide Richard, (Case-study 11 in the **Resources Section**) with suitable learning materials.
3. Sequence these factors into a series of steps that would form the basis of an individual learning programme.

Guidelines for facilitators

1. Provide the group with the case-study.
2. The activity requires the group to think about the *process* of developing materials not the actual materials. They may need prompting, before the brainstorm, to think along these lines.
3. The activity can be followed up by presenting the flow chart of processes.

CASE-STUDY

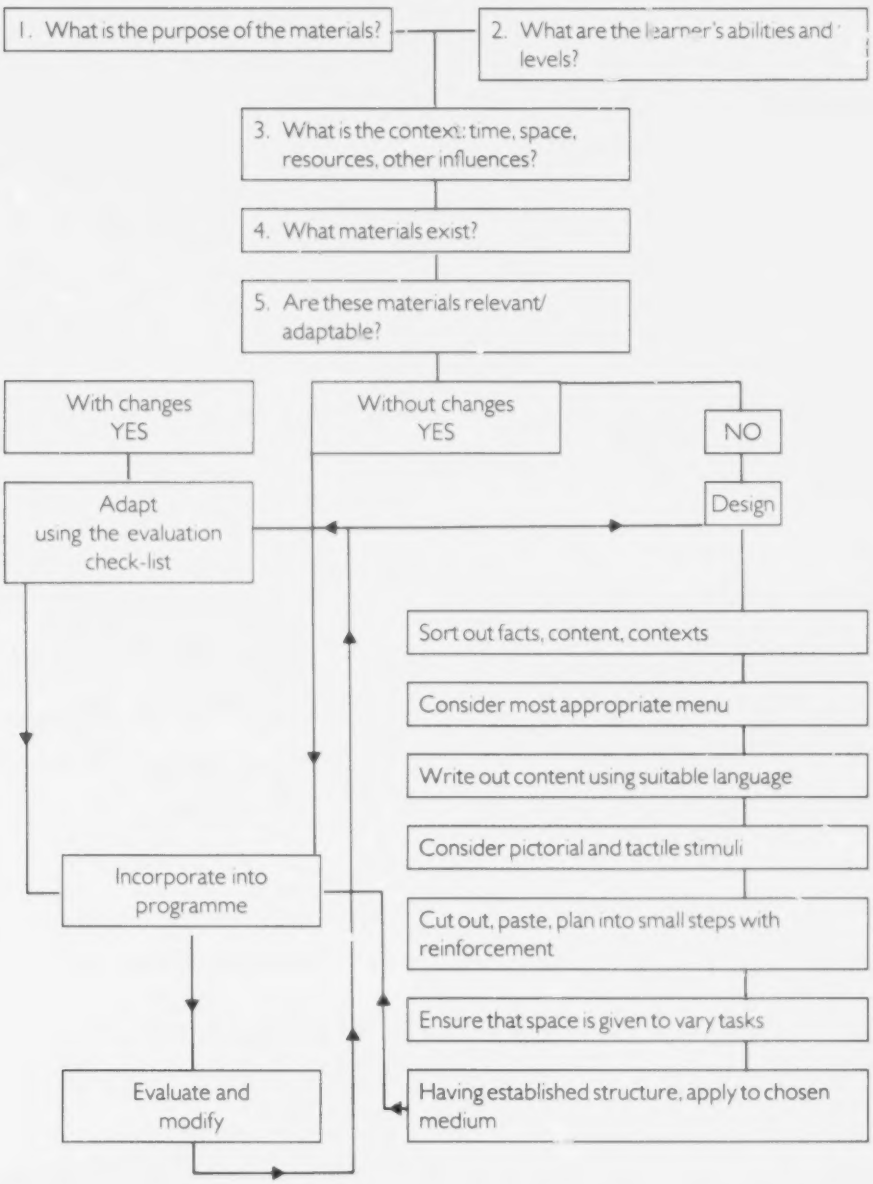
Richard has difficulty with reading and writing. He is on a YTS catering programme, but his inability to read the recipes usually provided is proving to be a major block to his progress.

What do you need to do to provide Richard with appropriate learning materials?

THE PROCESSES OF DESIGNING AND ADAPTING LEARNING MATERIALS – A FLOW CHART

In the following pages we explore the processes you have tackled in Exercise 2 in some detail.

We start with a model of the process.


1. What is the purpose of the materials?
2. What are the learner's abilities and levels?
3. What is the context: time, space, resources, other influences?
4. What materials exist?
5. Are these materials relevant/ adaptable?
With changes YES
Without changes YES
NO
Adapt using the evaluation check-list
Design
Sort out facts, content, contexts
Consider most appropriate menu
Write out content using suitable language
Consider pictorial and tactile stimuli
Incorporate into programme
Cut out, paste, plan into small steps with reinforcement
Ensure that space is given to vary tasks
Evaluate and modify
Having established structure, apply to chosen medium

COMMENTS ON FLOW CHART

The five questions at the beginning of this model reflect the typical considerations made by staff when selecting material. **Materials are aids to learning not substitutes for planning**. They must be used in context.

So we need to know (Questions 1, 2 and 3 of the flow chart):

- what they are for;
- who will use them;
- and where they will be used.

Question 4 has two aspects to it. There is no point in 'reinventing the wheel' every time. There are substantial sources of material which either you or your colleagues possess, or are available commercially and through resource centres.

SIGNPOST
See the end of this element and Element 9, Sources of Help and Advice

Conversely the 'any resource will do' approach has its pitfalls. It is sometimes necessary, but never really acceptable, to grab the nearest resource and use it. If you have answered questions 1, 2 and 3 carefully, then this should not happen.

Question 5 points to the sometimes complex task of judging what is relevant and appropriate.

EXERCISE 3. EVALUATING MATERIALS

Small group activity

Evaluating materials to suit learners with special needs can be complex. Sharing ideas with colleagues helps to form your ideas.

This exercise gives you the chance to share ideas using a selection of learning materials.

Looking at the materials provided, evaluate their appropriateness for learners with special needs. The evaluation check-list will give you guidance on how to do this.

Guidelines for facilitators

1. Collect some existing learning materials that are relevant to group members' existing work, or ask them to bring their own.
2. Focus on a particular group of learners (if there is a group common to members), or use one of the case-studies outlined in the **Resources Section.**
3. Form groups.
4. Provide them with the Evaluation check-list for Exercise 3.
5. Ask the groups to evaluate the materials' appropriateness for the learners identified.
6. Exploring the questions will give the members a reasonable guide to:
   - using the materials directly or
   - using them with modification or
   - seeing the need to design their own.
7. The check-list provides clues to what needs to be done.

EVALUATION CHECK-LIST

To help you evaluate you may find the following check-list helpful:

Relevance

- Are the materials relevant to your:
  - purposes?
  - learners?
  - situation?

Requirements

- Do the materials assume:
  - prior skills?
  - prior knowledge?
  - prior experience?
  - prior resources?

Accessibility

- Can the materials be used by:
  - a group?
  - individuals?

Appropriateness

- How appropriate for the learners are:
  - the language?
  - the graphics?
  - the medium?

Flexibility

- Do the materials allow learners to start at different places?
- Do they cater for a variety of levels?
- Do they allow learners to move at different paces?

Facilitation

- Do materials enable:
  - learning?
  - understanding?
  - transfer?
  - extension?

SOME FURTHER NOTES ON THE EVALUATION CHECK-LIST

(Use this in conjunction with the check-list.)

Relevance

If it isn't relevant, then it has to be scrapped – obvious really.

Requirements

For this section we are considering what assumptions have been made, and if they are justified.

Prior skills Do the learning materials require skills which the learners do not have? (For example, a learner with numeracy difficulties may not be able to calculate quantities. Thus she or he is not able to use, say, a cake recipe that is presented in a conventional form.) If so the temptation may be to use the learning material to teach the skill; this is not always appropriate for two main reasons:

- Those learners without the skill may be slow learners; it would be unrealistic to expect them to learn more than those who have the skill.
- The learning material may be inappropriate to teaching the skill.

To be realistic, the learner must be taught the skills separately; those who already have the skill can use this as a consolidation exercise.

Prior knowledge If there is an assumption that some information is already known and that information is not known, can it be provided?

In many instances the information need not be detailed and can be supplementary to the learning material. Its use will also help the internalisation. For example, one way of promoting self-reliance with a learner who uses a wheelchair would be in increasing wheelchair maintenance skills. You find a manual which will help, but it assumes some knowledge of mechanics. By providing those pieces of information directly necessary you can supplement the skills and promote learning of both how and why the wheelchair can be maintained.

Prior experience Perhaps the most difficult of the three 'Priors' to cater for as it implies familiarity and consistency.

It is not always possible to provide a 'real world' experience before the learner has to acquire a skill, so simple 'knowing about' may have to suffice or a simulated experience have to act as a substitute. For example:

> The decision over payment for something may include consideration of the pros and cons of hire purchase, rental and cash. The skills of percentage and interest calculation, etc. can still be taught.

Prior resources

- Are the required resources available:
  - in house?
  - on hire?
  - on loan?
- Can they be made?
- If not, then the medium must be reconsidered.
- If the resource is to be borrowed then where else can it be used during the time it is available? This may be a purely financial consideration, but it will help requisition orders.

Accessibility

We are looking at:

- how you do it;
- levels of writing;
- teaching and teacher/trainer – learner relationships and peer relationships.

Accessibility for a group If a learning material is generally inaccessible then it should not be used as it will only confuse or reinforce a sense of failure, e.g. GCSE students reading degree level papers for 'background reading'.

Accessibility for an individual Here we are talking about the direct sensory/cognitive effects of a disability. If an individual, alone or in a group, cannot use learning material how can it be supplemented or redesigned to be accessible? A learner with visual impairment, a learner with low literacy, or one who has difficulty with print may be helped by using an audio cassette. Her or his written answers may be represented in pictorial form.

Appropriateness

A similar area to access, looks more at specific properties of the learning material.

Language

- Learners may be alienated by the use of language at an inappropriate level.
- If the language level is too high learners will concentrate on language rather than on the learning objective.
- If the level is too low then learners may feel patronised.
- The key process here is to simplify the language initially, giving concise instruction/information with expansion if required for learners who want more background information.

Graphics Concerned with visual presentation, layout, size of print, colour, etc.

The temptation is often to get as much information as possible into the learning material, resulting in the learners not being able 'to see the wood for the trees'.

Examples:

- Newsprint or type is difficult for many people to read so enlarge if possible or handwrite.
- A general point of good practice is to photocopy OHPs (handwritten preferably); learners can associate the layout and keywords with the lesson, which helps recall.
- Drawings, artistic and technical, are easily overcomplicated, so isolate the specific part of the drawings required and enlarge. The complete drawing can then be provided to give an overview.
- Effective use of colour can highlight written or drawn graphics and help learning by breaking down large pieces of work.

Medium This is largely concerned with the sensory/physical effects of disability. If a learner is not likely to respond to a given medium first, consider if the medium itself is being used to its full potential, i.e. subtitles on video for hearing impaired students, sound effects or audio cassettes if attention span is short, illustrations on written sheets. If the medium itself is not adaptable, another medium altogether should be used.

Flexibility

Mixed ability teaching makes a great many demands on both you and the learners. Incorporating special needs learners increases those demands considerably (having got this far, you've probably realised that); this section really attempts to assess the suitability of the learning material for mixed ability teaching/training/learning.

Access points For a free-standing short unit of material this is not so important, but for larger learning material it is crucial. Can learners select the areas of the learning material that they want to approach, and work on these in isolation (assuming they have prior skills and knowledge)? If not, can the learning material be broken down into free-standing modules to accommodate this? Can the learning be approached at different levels for different ability (or even motivation) levels?

A good example is this package, which could have been written as a serialised book where you (the learner) started at the beginning and finished at the end.

Because everyone who uses this package will have different skills, knowledge and experience, it has been modularised so that you can work on the areas you want to and construct your own learning programme level.

It is probably true to say that everyone who uses a learning material will learn a different amount, and that the more varied the abilities, the more varied the amount of learning. The job of the learning material is to cater for all abilities and to promote as much learning as possible for all of them.

You should be flexible in encouraging a range of responses from learners in order for them to work from their particular strengths.

Facilitation

Questions to ask: this is really a final check on the learning materials to make sure they are doing all the things they are meant to.

Learning

- Does the learning material facilitate learning?
- If not, back to the drawing board.
- If it did before adaptation, where did it stop?

Understanding

- Does the learning material facilitate understanding?
- If not, why not?
- Redraft.
- Simplify.
- Expand.
- Explore other media, as covered above.

Transferability

- Are the skills learnt transferable?
- A debrief session may be necessary to highlight this aspect.

Extension

- Where does the learning lead to?
- There should be room for follow-up in any piece of learning. The skill is in finding it.

DESIGNING MATERIALS – AN EXAMPLE

If you think the existing materials are not appropriate then you will need to design your own.

Refer back to the process flow chart on Page 5.

Here you see a sequence for designing materials. You will notice that the sequence suggests getting your ideas and materials together *first* before you apply them to the medium you have chosen. Trying to battle with ideas and means of production at the same time can pose great difficulties – unless you are particularly skilled. For us lesser mortals the step-by-step approach ensures nothing is left out.

The process involves sorting out the key features of content and context:

- deciding what is the purpose of the materials. Then:
  - analysing the sequence and writing in appropriate language;
  - choosing the medium;
  - making the materials;
  - applying the materials.

For example, *Changing a car wheel*:

Analyse the sequence and write in appropriate language.

- engage handbrake
- find jack and spare wheel
- remove cover to securing belts

SIGNPOST
Task analysis may be useful here. See Element 5, **Training/Teaching and Learning Strategies.**

- loosen wheelnuts (brace)
- check wheels
- find jacking point
- lift car on the jack
- remove wheel and put on spare
- tighten nuts (hand)
- lower jack
- tighten nuts (brace)
- replace cover
- replace jack and wheel.

EXERCISE 4. USING SIMPLE LANGUAGE

Individual activity

It is very easy to confuse or 'lose' people by the use of long sentences and complicated words. Some learners with special needs have particular difficulty with language.

This activity provides you with the opportunity to develop your use of appropriately simple language.

1. Look at the list of phrases and words provided.
2. Find words to express them more simply.
3. Compare the answers.

Guidelines for facilitators.

1. Provide group members with the Word-list (overleaf).
2. Give them the time to complete it.
3. Record answers (including alternatives).
4. Use the suggested answers (below) to consolidate those already recorded.

WORD LIST

Here is a list of words/terms. Find ways of expressing them in simpler language.

1. arrive at a decision
2. in spite of the fact that
3. make an attempt to
4. in the vicinity of
5. a proportion of
6. have been shown to be
7. at that point in time
8. in most cases
9. bring to a conclusion.
10. a small number of

a. accelerate
b. approximately
c. commence
d. consequently
e. demonstrate
f. facilitate
g. initiate
h. locate
i. nevertheless
j. opportunity
k. principal
l. proportion
m. terminate

USING SIMPLE LANGUAGE – SOME SUGGESTED ANSWERS

1. decide
2. although
3. try
4. near
5. some
6. are
7. then
8. usually
9. finish
10. few

a. speed up
b. about
c. begin
d. so
e. show
f. help
g. start

h. find
i. but
j. chance
k. main
l. part
m. end

Choose medium

Keeping in mind the example of changing a car wheel (introduced on Page 9), variety and reinforcement of the written word can be provided by a series of still photographs of each step of the activity. The sequence can be reinforced by either a script to be read out and/or an audio tape. (The latter may need pauses in it to allow for different paces of learning.) A video of the whole sequence will reinforce the combination of steps.

EXERCISE 5. CHOOSING THE MEDIUM

Individual activity

Choosing the right form of presentation is very important for learners. A medium which is appropriate to their capabilities will promote learning, but one which is either too complex or too simple is likely to be off-putting.

This activity examines your perceptions of appropriate media and how to relate them to individual needs.

Show (by a tick or ticks) which medium or combination of media you would use for the following:

	Written	Still	Moving	Sound	Activities
Changing a wheel					
Imagining the feelings of others					
Presenting a series of connected facts					

Now try it again for:

- a learner with visual impairment;
- a student with literacy difficulites.

Discuss your choices in groups. How do they vary?

11

Guidelines for facilitators

1. You may need multiple copies of this sheet to allow group members to develop their ideas.
2. The supplementary sheet focuses on the needs of learners rather than the content.

SUPPLEMENTARY MATERIAL

There are no 'right' answers to this exercise. The point is to note how the needs of the learner influence your choice.

A check-list to use when deciding on choice of medium

Note down any practical difficulties your learners might face when using any of the following media.

	Learner 1	Learner 2	Learner 3
Written text			
Slides			
Audio tape			
Video			
Tools			
Activities			
Other e.g. tactile			

Having chosen the medium (continuing the example of changing a wheel), you then need to produce and/or acquire the materials which will form the framework for your finished piece. Remember to use language which suits the learners.

Make materials – using decisions made above

Once you have collected all your resources together put them into an appropriate sequence. This can be done by using the storyboard approach used in film-making.

- Cut out your resources
- Put them in sequence
- Ensure there is reinforcement at various stages
- Use small steps
- Vary the image/experience.

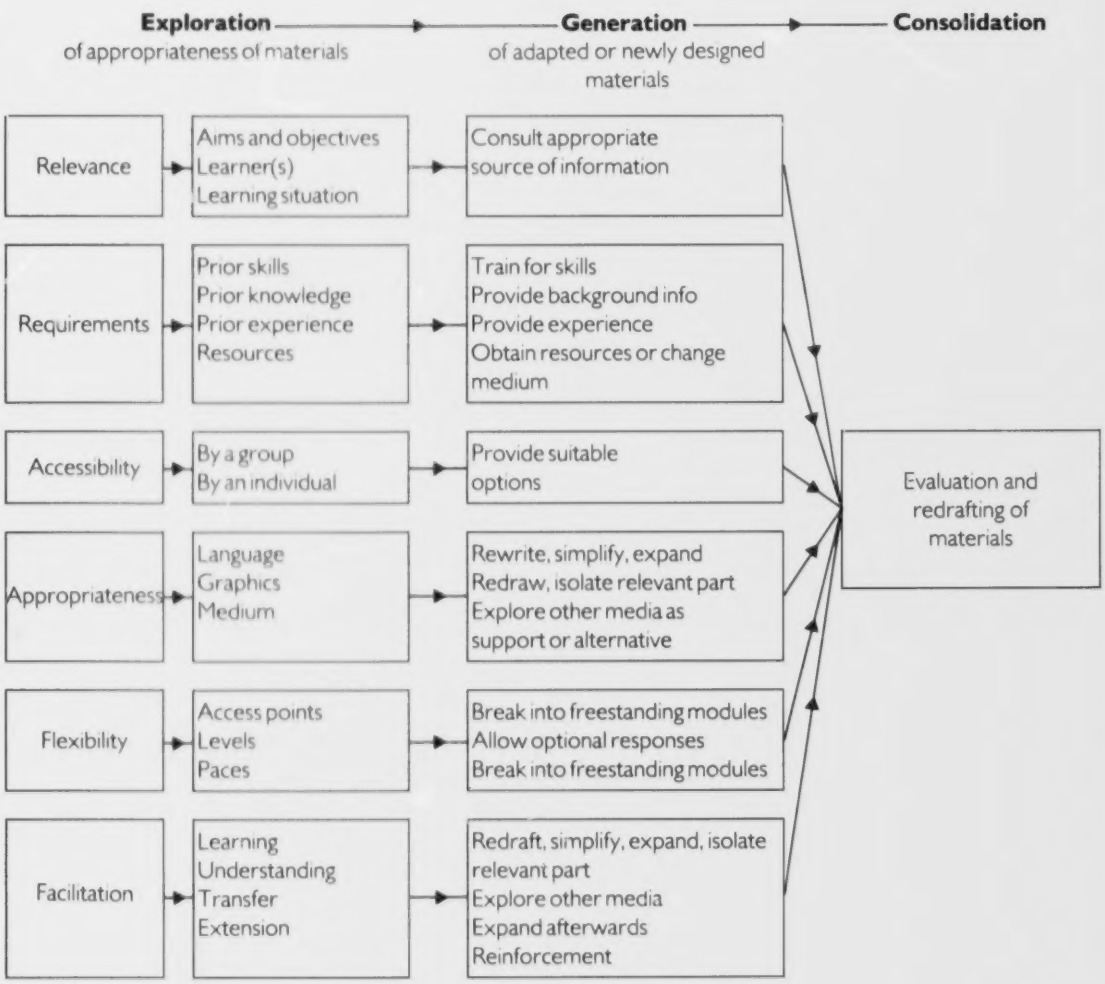
Once you are satisfied with this apply it to the medium you have chosen.

Apply materials

You will need to test their value. In this case the final test will be if the wheel stays on! Less drastic tests such as naming parts, describing the sequence, what to do if the nuts are too tight, will all help.

Throughout this exploration of design and adaptation of materials we have used a check-list. Here we present this in its full form.

CHECK-LIST. RRAAFF



EXERCISE 6. APPLYING THE DESIGN PROCESS

Individual activity

Having explored the various aspects of design, this activity now draws everything together. In it you are asked to apply the ideas (given in the previous pages) to designing materials for your learners.

Small group activity

1. Apply the design process *either* to some materials that you wish to develop for your learners *or* develop materials for:
   - a learner with visual impairment;
   - a learner with literacy difficulties;
   - a learner who uses a wheelchair;

   in your area of work.

Guidelines for facilitators

1. This activity is suited to a materials development workshop. The full activity may not be completed within a single session. It can be used over a series of sessions.
2. It is important to allow time for ideas to develop.
3. The rate of production may be slow. Encourage participants in the workshop to keep to simple approaches and materials. Making things over complex is likely to deter both participants and the learners themselves.

SUMMARY

Explore how the materials suit the learners.

Generate adaptation of newly designed materials.

Consolidate by testing them out, evaluating and fine tuning.

It is important to make use of the range of advice, guidance and support that is available to you.

This can be:

technical	– through resources units;
commercial	– through professional packages;
training/educational	– through colleagues;
individual	– through consulting learners.

(Refer to **Resources Section**)

A final reminder

Learning materials provide part of the support which learners with special needs require. They are not a substitute for appropriate planning and organisation. They do enable learners to be active and take responsibility for their own learning (with your guidance).

EVALUATION CHECK-LIST

Can you:

- describe what is meant by learning materials?
- do you understand how learning materials fit into the development of learning?
- what main questions do you need to ask in selecting materials?
- what factors do you need to take into account when making an initial evaluation of learning materials?
- can you differentiate between design and adaptation of materials?
- how do you adapt materials?
- what is the process for designing materials?
- do you know how to select the appropriate medium?
- can you use the right language?
- how do you evaluate the material you have designed?

SIGNPOSTS

Links to other elements include the following:

SIGNPOST
Element 5. **Training/ Teaching and Learning Strategies**

SIGNPOST
Element 9. **Sources of Help and Advice**

6

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